A BACTERIOLOGICAL INVESTIGATION of Eighty-two CASES of SKIN DISEASE, treated at the Edinburgh Royal Infirmary, during the Winter of 1900-1901.

By

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As house-physician to the Skin Department of the Edinburgh Royal Infirmary, I have had, during the past winter, the opportunity of seeing a large number and variety of skin diseases, and have been enabled to carry on a bacteriological study of many of the cases which have presented themselves. In doing so, there has been no selection of any particu-lar disease, cases having been selected at random.

TECHNIQUE.- It is probable that an elaborate cleansing of the skin on surgical lines, prior to the use of the platinum needle, will render the results obtained from inoculation, valueless, or at least, unreliable. The organism responsible for, or in association with the skin lesion, will probably suffer with the rest, where a process of antiseptic cleansing is thoroughly carried out, and thus the result obtained may be misleading. Most of the

the cultures have been taken from a vesicle, a pustule, or from beneath a scale, or scab, and as a rule from the most recent lesion obtainable, and a fairly pure growth, free from contamination, has been aimed at.

I have taken the usual precautions--sterilising the needle immediately before and after use--exposing the media for as short a time as possible--and passing the plug through the flame, before insertion.

In treating the skin, the method followed by Professor Caspar Gilchrist, Clinical Professor of Dermatolo-gy, at the Johns Hopkins University, has been adopted. In a paper read by him before the American Dermatological Association in May 1899, he thus describes his method:- "The surface of the affected area of skin, having been wiped off thoroughly with sterilised cotton, saturated with 95% alcohol, the vesicle or pustule was opened with a scarifier rendered sterile by being passed through the flame, after which the platinum "needle" was passed into the lesion." "In the case of dried pustules or scabs, the edge was lifted up with a sterile instrument, and the platinum point was passed under the scab."

Beyond this, and the exercise of great care in the

the rapid insertion and withdrawal of the platinum point, at the spot most likely to yield good results, nothing active has been done.

MEDIA.- The Medium most commonly employed has been slant agar, prepared either from freshly minced meat, free from fat, or from the extract of meat. The best results were often got with Sugar agar.

In the preparation of 1 Litre of the Medium, the following quantities were taken:-

Freshly minced lean meat, - -	1 Pound.
or, Liebig's Extract of Meat, -	10 grammes.
Peptone, - -	10 -
Sodium Chloride, - -	5 -
Grape-sugar, - -	5 -
Agar-agar, - -	15 -
Water, - -	1 Litre.

Gelatine has also been used. In preparing this, freshly minced meat was used in preference to the Extract, and the following amounts were taken:-

Freshly minced meat free from fat, -	1 Pound.
Peptone, -	10 Grammes.
Sodium Chloride, -	5 -
Gelatine, -	62½ -
Water, -	1 Litre.

The ordinary methods in the preparation of these

these media were observed.

Glycerine-agar has also been used occasionally, and sub-cultures have in most cases been made upon potato and upon bouillon. Most of the cultures have been examined twenty-four hours after inoculation, and repeatedly at intervals thereafter.

Microscopic Films have been made from the majority of the cultures, gentian-violet being the stain used.

I shall group the Cases under various diseases, as follows:-

IMPETIGO CONTAGIOSA.- Cultures were obtained from fourteen cases of Impetigo Contagiosa, being taken from an early vesicle in one or two instances, in other cases from a pustule and yet in others from beneath a scab, or from a weeping surface.

The Staphylococcus Pyogenes Citreus was obtained in one case.

" " Albus - one case.

" " Aureus alone three cases.

" " Aureus one case.

and " Epidermidis Albus

The Streptococcus Pyogenes grew in eight cases,--growing pure in two cases--with the Staphyloccus Pyogenes Citreus in two cases--with the Staphyloccus Pyogenes Albus in two cases and with Staphyloccus

Staphylococcus pyogenes aureus in two cases.

(1) Thos. Cunningham aet.28.- Voluminous canary yellow growths on agar and potato. Microscope shews small cocci tending to arrangement in twos and groups. Staphylococcus p. citreus.

(2) John McLeod.- Agar culture after 48 hours, shews minute semitransparent white colonies.
Gelatine subculture shews after 48 hours a thin streak in track of needle, No liquefaction.
Microscope shews a number of short chains. Streptococcus pyogenes. (After a week's growth the colonies were observed to have become black in the centre and a considerable black deposit existed in the condensation water. This occurred in other cultures, and notably in a case of Impetigo coexisting with Pediculosis, and may probably be due to some chemical change in the media.) Later than the streptococcal growth appeared that of the Staphylococcus pyogenes citreus, subcultures being taken on agar, gelatine, potato and broth.

(3) Wm. Stark.- On agar, broth, and potato, growths were typical of the Staphylococcus pyogenes albus. The microscope shows cocci arranged in groups of two, threes and fours. Gelatine growth

growth was unsatisfactory.

(4) Christina Rutherford aet. 8.- Shewing typical impetiginous honey crusts on the scalp, nose, neck and buttock. Inoculations from a lesion on the nose on agar and on broth gave streptococcal growths. The microscopic preparation made from the broth culture shewed typical chains of streptococci. An agar sub-culture was taken from the broth, and shewed after 24 hours characteristic colonies of the Streptococcus pyogenes.

(5) Maggie Alexander aet. 8.- An atypical case like one secondary to Pediculosis, shewing a serous form of crusts with dry scabs.
On agar, a pure orange yellow growth was obtained, from which an inoculation was made in gelatine,--both growths being typical of the Staphylococcus pyogenes aureus.

(6) Henry Shamley aet.12.- Disease well marked on the face. Growths on agar and broth suggested the streptococcus and the microscope confirmed this.
The streptococcal growth became mixed later, with a larger white growth, which proved to be Staphylococcus pyogenes albus.

(7) Robert Rollo aet. 5.- Impetigo of the face. On agar a streptococcal growth developed, mixed with

with a larger opaque white growth. Broth subculture and the microscope gave the Streptococcus pyogenes. The larger white growth took on later, a light yellow colour and on potato a lemon yellow colour. Microscope--Staphylococci. The Staphylococcus pyogenes citreus.

(8) Donald Matheson aet-12.- Impetigo on face. Duration--14 days. One inoculation from a lesion ten days old; another from a lesion fourteen days old. Both lesions were in the pustular stage. From the former, a pure growth of the Streptococcus pyogenes was obtained. The latter gave the Strepto -coccus and the Staphylococcus pyogenes aureus. In both cases subcultures were made in broth, and microscopic films were prepared, shewing beautiful chains of streptococci. From the broth in each case, a subculture was again taken on glucose agar, and in each case pure growths of the Streptococcus were obtained.

(9) Jas. Carse aet. 12.- Disease on the face and mucous membrane of the lip. Two inoculations were made, both from beneath scabs. One gave a pure Streptococcus, confirmed by growth on gelatine and broth, and by the microscope. The other gave a growth of the Staphylococcus pyogenes aureus.

aureus.

(10) Wm. Matheson aet.14.- Duration--three days. One inoculation from a clear vesicle on the chin. One inoculation from beneath a scab on left auricle. Both tubes gave growths of an almost pure Streptococcus pyogenes. This was confirmed on gelatine and by the microscope.

(11) Robert Wilson aet.5.- Impetigo on face, forehead, cheeks and upper lip. The primary lesions appear to be pustular, and the crusts have a more purulent appearance than usual. One culture was taken from a weeping surface. One culture was taken from a pustule. The latter was sterile. The former gave a streptococcal growth almost entirely masked however by that of the Staphylococcus pyogenes albus. The streptococcal growth was picked off and redone in broth, and from this subsequently, a microscopic film was prepared, shewing long chains of Streptococci. Streptococcus pyogenes.

(12) Wm. Knox aet.30.- Large patch with thick yellow crusts on right side of the chin. The inoculations were taken from sero-purulent fluid, and cultures were obtained on agar, gelatine and potato of the Staphylococcus pyogenes aureus, and the Staphy-lococcus epidermidis albus.

(13) Robert Connor aet.17.- Impetiginous Eczema

Eczema behind one ear; no spots on other parts. The appearances were at first sight suggestive of ec -zema intertrigo. On agar, gelatine and potato cultures were obtained of the Staphylococcus pyogenes aureus.

(14) Chas. Alexander aet.18.- Typical crusts of impetigo contagiosa on the face. No vesicles. Crusts raised, and inoculation taken from beneath. A pure growth was obtained on agar, of the Streptococcus pyogenes. A microscopic film was prepared from the deposit in the water of condensation, and long chains of streptococci were seen. After six days the agar still shewed a pure streptococcal growth.

Professor J. Caspar Gilchrist, in a paper already referred to, and entitled "A Bacteriological and Microscopical Study of over Three Hundred Vesicular and Pustular Lesions of the Skin, with a Research upon the Etiology of ACNE VULGARIS," gives the following results in Impetigo Contagiosa:-

17 Cases--the cultures taken from pustules and from beneath scabs. Got the Streptococcus pyogenes in every case. In ten cases, pure cultures: in six cases mixed with the Staphylococcus aureus or albus or both: in one case mixed with the pseudo-diphtheria bacillus.

The results in my cases are by no means so uniform, yet

yet the Streptococcus was obtained in eight out of fourteen cases, as already stated. Sabouraud of Paris, in his paper on the "Dermatophytes" in the 1st Volume of "La Pratique Dermatologique," published 1900, calls common Impetigo of the face "L'Echthyma Streptococcique" shewing that he has no doubt of its streptococcic origin. "L'Echthyma Streptococcique" (common impetigo of the face) originates as a lesion which is properly neither a vesicle nor a pustule, but a "phlyctenula." It is a small soft epidermic blister, half-filled, of irregular and indented surface, variable in size, but generally about as big as a pea, translucent and containing a somewhat thin liquid. The examination of this liquid, does not generally show any microbe. A culture must be made, to show the streptococcus. The "phlyctenula soon bursts; the serum which it contains runs out, and coagulates in yellow crusts, being thereafter infected by a prodigious quantity of Staphylococci aurei. When the "phlyctenula" does not burst the staphyloccus invades it very quickly all the same, purulent changes rapidly following. It is this lesion, habitually fleeting and trivial, nevertheless contagious, inoculable, and epidemic, which by the diversity of symptomatic descrip-tionsgiven of it, the divers microbes which have been

been found on it, and the names by which it has been designated, has caused among bacteriologists and dermatologists the dispute on the streptococcic or staphy-lococcic origin of impetigo."

Although one is not in a position to make author-itative statements from an examination of a few cases, yet the fact that the streptococcus was obtained in more than half of my cases, is interesting, and at least, goes to support the views of the above-mentioned observers.

Bockhart has described a disease, now known as the Impetigo of Bockhart, which is characterised by the rapid development of peri-follicular pustules, and which is apparently staphylococcic in origin.

The question of the identity of the streptococci found in such widely differing diseases as, for example, erysipelas and impetigo contagiosa, is one of great interest. To many observers it seems most improbable that the same organism should be capable of such widely differing results.

In an article in the Lancet (April 11th, 1896) on "The Rôle of the Streptococcus Pyogenes in Human Pathology" by Wm. Bulloch M.D.(Bacteriologist in the British Institute of Preventive Medicine) the following statements appear:- "The opinion now almost universally

universally held, is that there is but one species of streptococcus, which plays a part in human pathology--viz., that generally termed Streptococcus Pyogenes." "Clinical and experimental evidences unite to show that diversity of lesion may be explained otherwise than by the presupposition that the infecting micro-organisms differ in species." "There are four main factors the variations of which determine the nature and extent of streptococcic lesions, (1) the extra-ordinary variability in the virulence of the microbe: (2) A variation in the site and depth of the infection: (3) Varying resistance on the part of the body--wit-ness the severe streptococcic lesions met with in advan-ced cases of diabetes and Bright's disease--: (4) the association of the streptococcus pyogenes with other microbes, pathogenic and non-pathogenic."

The same Author in "A Contribution to the Study of Streptococcus Pyogenes," which appeared in the Trans-actions of the British Institute of Preventive Medi-cine, First Series, 1897, states that in the case of a "large number of streptococci obtained from widely different sources" it has been found "impossible to detect marked differences in the cultural and morpho-logical characters." He also states that "An animal immunised against a weak streptococcus, is also to a

a very large extent immune against a streptococcus exalted to a highly septicæmic condition by passage through rabbits."

SCABIES.-

The pustules present in four cases were examined. Two gave cultures of the Streptococcus pyogenes, and two, the Staphylococcus pyogenes aureus.

(1) Maggie Chambers aet.7.- Pustule on finger. Cultures on agar, gelatine and potato gave orange yellow growths typical of the Staphylococcus P.aureus.

(2) Maggie Eadie aet.10.- A case of scabies with impetiginous lesions on the palms. Culture from large flat bulla, ¾inch by ½inch, on palm, gave the Streptococcus pyogenes.

(3) Patrick Reilly aet.25.- Scabies with phlegmonous inflammation and lymphangitis. Culture from a pustule containing creamy pus, gave the Staphylococcus pyogenes aureus.

(4) John Gentle aet.19.- Duration, 6 months. Large pustules to size of a sixpence present on dorsum of hands and flexor aspect of wrists. Culture from recent pustule on dorsum of hand gave the Streptococcus pyogenes. (The agar growth was without contamination.)

ECZEMA.-

In nine cases of chronic eczema, the Staphylococcus pyogenes aureus was obtained six times; " " " with the Streptococcus pyogenes occurred in one case; the Streptococcus pyogenes occurred alone in one case, the culture being taken from a vesicle which was present; while one case gave no growth, having been treated with Caustic Potash (1-4) according to Hebra's Method prior to the inoculation being taken.

(1) Walter Brown aet.8.- Ward 37. A widespread chronic eczema of several years' duration, the face, trunk and limbs, being more or less affected. Culture from beneath a scale, gave growths on agar, gelatine and potato of the Staphylococcus pyogenes aureus.

(2) Mrs Rice. Ward 38.- Culture from beneath a scale, gave a mixed yellow and white growth after some days. The yellow growth appeared pure on a subculture on potato. Gelatine plate cultures were taken to separate the white and yellow growths and agar subcultures were taken from the colonies on the plate. The yellow developed on the agar and when taken again on gelatine, liquefied it in a typical staphylococcal fashion, with yellow deposit, proving

proving to be the Staphylococcus pyogenes aureus. The white, grew in gelatine along the streak without any liquefaction. A subculture was again taken from this on to agar, and grew in the clear minute dewdrop -like fashion of the Streptococcus pyogenes. It was taken again on broth and a microscopic film was prepared, shewing chains of streptococci. In this case then, a mixed growth was obtained of the Strepto -coccus pyogenes and the Staphylococcus pyogenes aureus.

(3) Jeannie Calder aet.11.- Patch of scaly and crusted eczema on the dorsum of the foot. Round and oval patches, dry and scaly, on the dorsal aspect of the hands. In this case the growths on agar, gelatine and potato gave the Staphylococcus P.aureus.

(4) Mrs Kilgour. aet.44.- Eczema of leg. Staphylococcus P.aureus.

(5) Mrs Orr.- Patch of eczema on back of both hands. In this case the surface was treated with Caustic Potash (1-4) and inoculation made from the exuded fluid, according to the method of Hebra. No growth after five weeks' incubation.

(6) Mrs Snowdon aet.20.- Ward 38. Eczema on scalp, neck, behind the ears, and on the legs. Four months' duration. She had been nursing for ten

ten months. Inoculation from the leg after four days' starch poulticing. The epidermis was macerated and white, but, here and there, was yellow. A yellow portion was raised, and the inoculation made from beneath. The Staphylococcus pyogenes aureus was obtained.

(7) Jas. Coventry aet.25.- Ward 37. Eczema of leg, of over six months' duration. Culture from beneath a scab. The Right leg was affected on extensor aspect, over an area extending from upper part of patella to four inches below the knee, and passing nearly round to back of leg. On admission the affected part presented a vividly red appearance, almost erysipelatous in hue, but the greater part was covered over with thick yellowish crusts, cracked in parts. Beyond the crusted area, extended the red inflammatory margin. On the cleaning off of the crusts, after starch poulticing, numerous gummatous-looking areas were revealed, and on other parts of the legs, stains, the sites of former "boils" (so-called by the patient), were seen. These were white in centre, and brown at margins. The elbow joints revealed ecthymatous-looking crusts, and a scaly condition of the skin. This then, which at first was diagnosed as an ordinary eczema, was found to have a specific origin.

origin.

Cultures of the Staphylococcus pyogenes aureus were obtained.

(8) Mrs Mc.Kay aet.64.- Eczema of leg. The largest patch was over outer side of left ankle. There were a good deal of infiltration and accumulated crusts, with marked pigmentation. The culture was taken from a minute vesicle which was present, and gave growths of the Streptococcus pyogenes.

(9) Cissy Thompson aet.18.- Eczema of back of hands. Duration-- two years' duration. Growths on agar, gelatine and potato, gave the Staphylococcus pyogenes aureus.

In the "Journal des Maladies Cutanées et Syphilitiques" of Paris, for November 1900, a full report, of which the following is a résumé, is given, of the discussion on eczema, in the Dermatological Section of the 13th International Medical Congress. The recent work of Unna was brought forward, and was adversely criticised by many other observers, whose results differed widely from those of Unna. Unna maintains that "eczema is essentially microbic in origin, contagious and epidemic, probably caused by various organisms corresponding to different varieties of eczema." He asserts that "it is impossible that all the white and yellow micrococci found on the skin, and liquefying gelatine,

gelatine, can be identical." Unna has set himself to study the intimate structure of these micro-organisms by staining methods, and he has thus been able to differentiate in eczema, twenty three different kinds of micrococci. (These staining methods are very elaborate and involve very fine microscopical distinctions, into which I have not attempted to enter.) Unna asserts that "amongst these twenty-three varieties, twelve when inoculated are innocuous and behave like saprophytes; eleven on the contrary give definite results when inoculated. Amongst these last, the two most important ones are the "Neufang" and Traubel-Paas,"--so named, after the patients in connection with whom they were first isolated." According to Unna, these two types are the specific Causes of Eczema.

Inoculated in the dog, they produced a disease analagous to that in man. Inoculated in man, they resulted in the appearance of a true eczema. In the presence of these results then, Unna distinctly declares that amongst all the microbes to be reckoned with in the etiology of eczema, he can in future, with certainty indicate two kinds, which can in man produce true papulo-vesicular eczema, spreading spontane-ously. As regards the morococcus owing to the inconstancy of its presence, and the small results

results from animal inoculation, Unna does not give it the same importance as formerly. He now classes it with the staphylococci, and thinks it may be the pathogenic agent of certain dry eczemas.

Other workers on this subject, however, have got results as precise as Unna's, but entirely differing from these obtained by him. Thus Mm. Veillon (Paris), Jadassohn (Berne), Frédérick, Kreibich, Torok, and Roth deny that the elementary, primitive, vesicular lesions of pure eczema, are microbic. M. Veillon has seen eczema evolve from beginning to end, perfectly sterile. None of the others mentioned above have been able to reproduce true eczema, experimentally in man. It is interesting to note the agreement in the results obtained by the above workers. All acknowledge the presence of the common microbes which are found to multiply on the surface of eczemas, viz., the Staphylococcus aureus and albus, alone, together, or with other microbes. Some maintain that staphylococcic infection has a special importance and is a constant factor in the etiology of eczema, without which no typical eczema, can be produced, while others are agreed that eczema can evolve completely while remaining sterile. Brocq asserts that sometimes a true eczema, neither

neither staphylococcal nor streptococcal in character, becomes superadded to a primary impetigo. All agree that the common microbes found on the surface, whether pathogenic or not, must influence the progress and development of the affection. Sabouraud inclines to think them the cause of the complications of eczema. Jadassohn (Berne) maintains that one must admit as etiological factors, local and general predispositions and mechanical and chemical irritations, the result of the invasion by the common micro-organisms depending on the local and general predisposition of the patient, and on the nature of the original process.
Galloway (London) holds that in the production of eczema, several factors come into play: above all, the presence of micro-organisms, the predisposition of the skin, and disturbances of digestion and assimilation.
Sabouraud asserts that the lesions of vesicular eczema (which he declares to be the clinical and anatomical type which ought to be taken as the starting point) are always at first sterile, but are invaded later by the streptococcus and the staphylococcus, which cause, in and around the primitive lesion, special and recognisable secondary lesions. Petrini de Galatz (Bucarest) says "eczema is neither contagious

contagious nor epidemic. It is a constitutional disease, encouraged by the soil and the diathesis of each patient." Neisser (Breslau) holds that the primitive lesion is sterile, but that the secondary infections are constant, and play an important and necessary part in the constitution of the affection. Unna's reply to the above criticism is that "true eczema is chronic eczema and not pure vesicular eczema" and states that his researches have all been carried out on chronic eczema and not on acute sterile eczema.

Sabouraud re-asserts that the eczematous vesicle is sterile at first and admits that it is probable that the microbes play an important part in the maintenance and recurrence of the lesion.

I was not fortunate enough to get an inoculation from an early eczematous vesicle, so can give no opinion on the above. Experience of eczema clinically, however, the generally acknowledged sterility of the primary vesicle, and the well-known occurrence of organisms on the healthy skin, incline one towards the view that eczema originally depends on causes, other than organismal, but, that once set up, the lesions are liable to secondary infection from the organisms already present on the skin, and these, as Sabouraud

Sabouraud says, will play an important part in the maintenance and recurrence of the lesion. Unna asserts that it is impossible that all the white and yellow micrococci, found on the skin, and liquefying gelatine, can be identical. In support of this, I may say that I have been struck by the variety in colour, obtained on media taken from the same stock, and apparently produced by the organism which is usually known as the Staphylococcus pyogenes aureus. Thus one gets, in one case, a golden yellow, in another, a darker yellow, in another a distinctly buff colour, these colours being reproduced on potato or seen in the deposit in the liquefied gelatine. This buff colour is noted under Seborrhoeic eczema, cases IV. and V. and in both of these cases, the gelatine liquefaction was clearer than is usual with the Staphylococcus pyogenes aureus.

SEBORRHOEIC ECZEMA.

In four cases, out of six, the Staphylococcus pyogenes aureus, was obtained. Of the remaining two, one gave the Staphylococcus pyogenes citreus, and one was doubtful.

(1) John Taylor aet. 32.- Typical seborrhoeic eczema of scalp, descending on to ears and cheeks. Inoculation from scalp after removing crust. Cultures gave the Staphylococcus pyogenes aureus.

(2) Mrs Cowie aet. 48.- Inoculation from scalp, after removal of a large greasy, seborrhoeic scale.- Staphylococcus pyogenes aureus.

(3) Mrs Craig aet. 26.- Pityriasis rubra seborrhoeic best describes this case. The affection was almost universal. Inoculation from under a moist looking crust on the chin. Cultures gave the Staphylococcus pyogenes aureus.

(4) J. Drummond aet. 15.- The scalp was much crusted and the eczema extended down behind the ears-- a very typical case. He had had seborrhoeic eczema as a child, but had been free for several years. A scale was implanted on agar, and gave a mixed growth, buff coloured and greyish white. A gelatine plate was made and took a week to show any growth, at the temperature of the room, at the end of which time,

time, yellow and white colonies had developed. These were again inoculated on agar, the yellow giving a lemon yellow growth, while the white gave a buff-coloured growth. The lemon yellow was reproduced on potato and proved to be the Staphylococcus pyogenes citreus. The buff growth, when taken on gelatine, actively liquefied, leaving a clear fluid with a flocculent deposit, but no distinct buff colour.

(5) Jessie McNair aet.3.- Scalp uniformly red and a few dry pustules on face, from which inoculation was taken. In this case also a mixed growth was obtained, shewing buff and greyish white. A gelatine plate was made and on it buff and greyish white colonies developed, a subculture of each being then taken on agar. Both tubes at first gave a white growth, while later, both shewed the buff colour. Gelatine subcultures were made and moderately active liquefaction followed, the fluid being clearer than is common with the Staphylococcus pyogenes aureus, and the deposit, distinctly buff. The peculiar buff-coloured growth in these two last cases, with the unusually clear gelatine liquefaction, is of interest, and worthy of further investigation.

(6) John Wilson.- baby.- Typical seborrhoeic eczema; scales on head very adherent and dry. Took

Took inoculation from moist surface from beneath scab on face. Cultures gave the Staphylococcus pyogenes aureus.

Kaposi (Vienna) holds that seborrhoeic eczema "is not a morbid entity, but is a secondary symptom, produced by the addition of seborrhoeic productions to the elements of eczema." (Dermatological Section of International Medical Congress, Paris 1900.)

Dr Allan Jamieson in his book on Diseases of the Skin (1894) pg. 241 says,--"the simplest conception of the complaint is that it is to be regarded as an eczema developing on a surface which has been for a longer, or a shorter time, affected with seborrhoea. Parasitic organisms take a considerable share in the production of the lesions."

ACNE VULGARIS.

In six cases examined, one gave the Staphylococcus epidermidis albus alone. Two, (in which the pus, from a deep pustule, was inoculated en masse on glycerine agar) were sterile. Two gave the Staphylococcus epidermidis albus with the later development on the surface of the porcelain growth of little reddish cone shaped colonies, which, microscopically showed a minute bacillus. While one gave (a) from a superficial pustule -- the Staphylococcus pyogenes citreus and the Staphylococcus epidermidis albus: (b) from a deep pustule -- the Staphylococcus epidermidis albus: (c) from an expressed comedo -- the Staphylococcus epidermidis albus and the Staphylococcus pyogenes aureus.

Three of the cases were associated with seborrhoea, and in one of these, the bacillus above referred to, was obtained.

(1) Kate Martin aet. 25.- Acne of face shewing well-marked comedones. Slightly seborrhoeic condition of the scalp. Culture from an acne pustule. On agar, potato and gelatine, gave the Staphylococcus epidermidis albus.

(2) David Pratt aet. 18.- Acne alongside of a seborrhoeic dermatitis. Cultures from a superficial

superficial pustule gave the Staphylococcus pyogenes citreus and the Staphylococcus epidermidis albus. Cultures from a deep pustule, (contents semi-solid, and were spread over the surface of the agar), gave the Staphylococcus epidermidis albus. Cultures from Comedo (expressed and rubbed over surface of agar) gave the Staphylococcus epidermidis albus and the Staphylococcus pyogenes aureus.

(3) Name unknown.- Pus taken from a deep nodule after disinfecting the skin with alcohol, and a mass inoculated on glycerine agar, according to the suggestion of Caspar Gilchrist. No growth of any sort was obtained even after the lapse of more than a month.

(4) Robert Duffin aet. 20.- Acne indurata of face of two years' duration. Culture from deep pustule after cleansing the skin with alcohol. The pus was inoculated en masse on glycerine agar, but no growth was obtained. Sterile.

(5) A. Drummond aet.19.- Acne associated with seborrhoea of scalp. Culture from small acne pustule gave at first, the white procelain growth of the Staphylococcus epidermidis albus but after a fortnight, on again examining the growth, small colonies about size of a pin head, were seen to have developed

developed on surface of white growth. These were cone shaped and of a faint reddish hue. A microscopic film was prepared from one of the little cones, and, on examination, revealed a minute bacillus.

(6) Wm. Miller aet. 22.- Acne vulgaris which had been indurated, but induration now very slight and pustules superficial. Culture from a superficial pustule gave the white glistening porcelain growth of the Staphylococcus epidermidis albus, as in caseV, and later on gave the small cone-like growth, precisely as in the last case. The microscope, here also, revealed a minute bacillus similar to that seen in case No. V. There is no note in this case, of the co-existence of seborrhoea.

Sabouraud, in an article on "Dermatophytes" in the 1st. volume of La Pratique Dermatologique, published 1900, described what he calls the "microbacillus of seborrhoea."

"It is a fine bacillus, one third of an inch in thickness and about one half of an inch in length." He gives a detailed description of it, and goes on to say that its culture is difficult.

"On glycerine agar after two days, each point of inoculation has given place to the white porcelain-like growth of the Staphylococcus epidermidis albus

albus which constantly inhabits the epidermic surface of all regions infected by the microbacillus. But, after some days, in the centre of each of these colonies, there appears and developes, a reddish cone, which is the culture of the microbacillus, and which increases until it reaches 2 mm. in height and diameter. One can, at the end of twenty-eight days, transplant the culture of the microbacillus for the impure coccus dies in twenty-six days, and the microbacillus in about two months. Thus one can obtain a pure culture of the microbacillus."

This description very closely corresponds with my own account of the growths obtained in cases V and VI, noted above. In V there existed seborrhoea, and it may have been present in VI, though I have no note of its occurrence.

I have notes of the occurrence of an exactly similar growth in a case of alopecia areata, to which I shall refer later on. It is strange that in none of the cultures of seborrhoeic eczema, was this growth observed.

Caspar Gilchrist in the paper already referred to, claims to have found a bacillus in cases of acne, which is "the specific cause of acne vulgaris." His method was as follows:- "Slant glycerine agar was

was used and the pus was not smeared over the surface, but planted en masse on the media" -- "especially when the whitish clump which one frequently detects in the pus was chosen, a colony of bacilli was observed to grow, although slowly and somewhat feebly" -- "The clump retained its colour (white), while it increased gradually in size. It formed a pultaceous mass of soft consistency and could be easily pushed en masse along the surface of the media. When half the mass was pushed further along the surface of the media, it would increase to double its original size in a week."

The bacillus was "motile and branched". -- In cases III and IV, this mode of inoculation en masse on glycerine agar, was tried, but, instead of giving the growth above described, the culture remained sterile in both cases.

PSORIASIS.-

The organism of Psoriasis, if one exists, may probably be present on the superficial aspect of the scale, and this might account for the negative results of cultures from beneath the scale.

(1) Elizabeth Weir aet.45.- Culture from beneath scale. At the end of a fortnight there was no growth.

(2) Thos. Gillespie aet.53.- Disease extensive on the lower extremities. Patches also on scalp, approaching the seborrhœic type. Culture from beneath a scale situated on a patch on the vertex. At end of a week--no growth.

EXFOLIATIVE DERMATITIS.-(Following Psoriasis.)

George Dalgleish. aet.24.- Scale implanted on agar, and subsequent sub-cultures taken on gelatine and potato. Growths were obtained, of the Staphylococcus pyogenes aureus.

SYCOSIS.-

Of seven cases of sycosis--

5 gave the Staphylococcus pyogenes aureus

1 - - - - citreus and

1 - - - - albus, and

- the Staphylococcus cereus flavus.

(1) John Taylor aet.32.- This man had been to the out-patient department earlier in the winter, suffering from seborrhœic eczema, of the scalp, descending to the ears and cheeks. He returned later with the scalp almost clean, but with the skin inflamed on both upper whisker regions, and shewing scattered follicular pustules over these parts. Inoculation was taken from one of these and a culture was obtained of the Staphylococcus pyogenes citreus. (In the seborrhœic condition preceding this, the Staphylococcus pyogenes aureus was obtained.)

(2) Joseph Walker.- Sycosis of entire beard and whisker regions, also of eyelashes. Not many pustules. Inoculation from pustule gave the Staphylococcus pyogenes aureus.

(3) Walter Heard,aet.45.- Lupoid sycosis, with considerable destruction of hair. Culture from small pustule on the cheek, gave the Staphylococcus pyogenes aureus.

(4) Jas. Allan.- Fairly typical sycosis. Numerous pustules with œdematous dermatitis between.

between. Culture gave Staphylococcus pyogenes aureus.

(5) Wm. Walls, aet.40.- Well marked sycosis, of long standing. Cultures gave the Staphylococcus pyogenes albus and the Staphylococcus cereus flavus.

(6) D. Mc. Gow aet.20.- Culture from a follicular pustule gave the Staphylococcus pyogenes aureus.

(7) Jas. Hunter, aet.31.- Sycosis of ten years' duration involving the entire beard region, and with coexisting eczema. Moustache region practically free. Culture gave the Staphylococcus pyogenes aureus.

FURUNCULOSIS.-

(1) D.Pratt, aet.18.- Culture from a furuncle following seborrhœic dermatitis, gave growth of the Staphylococcus pyogenes citreus.

(2) Maggie Scott, aet.12.- Culture from furuncle gave Staphylococcus pyogenes aureus.

(3) Geo. Fraser.- furuncle secondary to seborrhœa of the scalp. Culture gave the Staphylococcus pyogenes aureus.

ALOPECIA AREATA.- Five cases.

3 gave the Staphylococcus epidermidis albus.

1 - - - - -

and the little cone-shaped colonies already described under acne. (Sabouraud's Micro-bacillus of seborrhœa (?). One grew an impurity (Proteus vulgaris).

(1) Alex. Young.- hairs on agar. After eight weeks' incubation gave nothing but the Staphylococcus epidermidid albus.

(2) Christopher Johnstone, aet.12.- Duration--4 months. Numerous pathes. Had ringworm a year ago. Culture gave the Staphylococcus epidermidis albus. No other growth after eight weeks.

(3) Wm. Robertson aet.19.- In this case, one hair was soaked for two minutes in absolute alcohol, and then implanted on agar. The other hair was not so treated. The alcoholic hair remained sterile. The non-alcoholic one grew the white porcelain growth of the Staphylococcus epidermidis albus, and later developed the peculiar cone-shaped colonies described under acne, and which here again, shewed under the microscope, a minute bacillus similar to that already described.

(4) G. Crookshank, aet.26.- One hair on glycerine agar--no growth. Sugar-agar--Staphylococcus epider -midis albus.

(5) Geo. Cherry.- Hair on sugar-agar--no growth. Hair on glycerine agar--dirty greyish white wrinkled

wrinkled growth (Proteus vulgaris).

RINGWORM.-

The growth of the fungi of ringworm is attended with much difficulty, a pure growth being peculiarly troublesome to obtain. This is especially true of the fungi present in ringworm of the beard, or of the body. There is a means of destroying the Saprophytic bacteria present in the hair, and yet sparing the fungus, which has proved most satisfactory. I refer to the method of immersion of the hairs in absolute alcohol for at least two minutes, prior to inoculation. This gives excellent results, in the case of the Microsporon, but is less satisfactory in dealing with the Tricophyta. Fox and Blaxall, in "An inquiry into the plurality of fungi, causing ringworm in human beings as met with in London" (published in the British Journal of Dermatology, July 1896) recommended teasing of the Tricophytic hairs in sterilised distilled water, and then inoculation of a very small portion of the diseased hair. Thus a growth is obtained in which the ringworm fungus at least, predominates. It is probable that the alcohol method would be equally successful if the Tricophytic hairs were immersed for at least fifteen

fifteen minutes. The successful cultures of the microsporon were all obtained in cases where the alcoholic immersion plan had been adopted.

RINGWORM.- Nineteen cultures.

In ten cultures (nine cases) the microsporon audouini grew. (All these were cases of Tinea capitis.)

In one case of tinea capitis, a growth of the large spored fungus was obtained--Trichophyton megalosporon, an abundant snowy cfater-like growth with central depression, being present by the eighth day. Unfortunately there are no notes of a microscopic examination in this case.

In one case of Tinea Barbae four hairs were taken, of which one was sterile, the others growing impurities. (In the case of one of these last the cone-shaped colonies described under acne developed).

In one case of Tinea Capitis the Staphylococcus epidermidis albus.

In two cases { Tinea Capitis / Tinea barbae } Staphylococcus pyog. aureus.

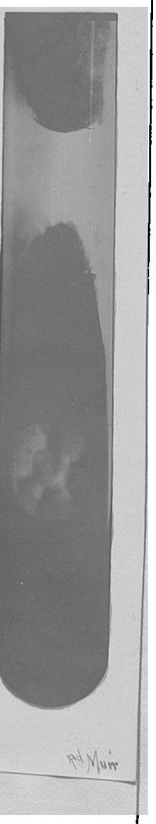
In two cases { Tinea capitis / Tinea circinata } Staph. pyog. citreus and pyog. albus.

In one case of Tinea Capitis, a peculiarly luxuriant and rapidly growing fungus was obtained, and this differed from any of the other ringworm growths.

In one case of Tinea Circinata--Negative Results.

(1) Wm. Milne aet.8.- Ward 37. Ringworm scalp. A croton dermatitis was produced in this case and in time a complete cure resulted, the loosened hairs being readily epilated. These, when implanted on agar, gave no growth of the fungus, but gave the Staphylococcus pyogenes aureus. (The small spored fungus was got in this patient, at another time. (See case 9.)

(2) Mary Croll aet.6.- Ward 38. Ringworm scalp. Extensive -- no growth of fungus, but the Staphylococci pyogenes citreus and albus grew.



(3) Name not noted. Ringworm of Scalp. Hair implanted on agar on 28th November, and on 3rd December an apparently pure growth had begun. On 27th December a typical small spored growth had developed, shewing folding and grooves. There was also a ring of yellow, giving a target-like appearance to growth. Microsporon Audouini.

(4) Name not noted. Ringworm scalp. Microsporon Audouini.

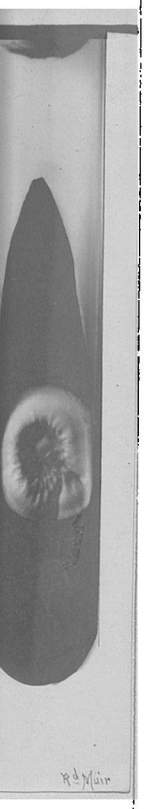
(5) Joseph Malone aet.25.- Tinea Barbae. Hairs extracted from the chin. Cultures gave only the Staphylococcus pyogenes aureus.

(6) Beatrice McPherson aet.9.- Tinea Circinata.

Circinata. Four rings on the cheek, evidently inflamed by treatment, and covered with small epidermic abscesses. Inoculation from one of these. Sterile.

(7) Wm. Gillespie aet.7.- Ringworm scalp. Pure growth of the Microsporon audouini. Yellow ring very distinct. Growth brownish yellow and with two folds.

(8) Maggie Skirving, aet.5.- Ringworm scalp. Three weeks' duration. Patches nearly denuded of hair. Some very fragile roots were seen. Some hairs, evidently diseased, still remained long. By the eighth day, there was an abundant snowy crater-like growth, with central depression. Trichophyton Megalasporon. (Unfortunately no notes of a microscopic examination).



(9) Wm. Milne, aet.8.- (Patient already quoted-- No.1.) Ward 37. The ringworm appears almost cured. One or two doubtful hairs were taken however and gave typical growths of the microscporon audouini.

(10) Wm. Martin.- Tinea Barbae. Four hairs taken. None grew the fungus--one sterile. The others grew impurities, but one of them which had grown a white translucent growth was observed, after nearly three weeks to have developed numbers of the small cone-shaped colonies referred to under acne,

acne, and the microscope revealed a minute bacillus as in the acne cases.

(11) Wm. Milne.- Ward 37. Hairs again taken and immersed in alcohol for two minutes prior to implantation on agar. All grew the microsporon audouini. This was verified by the microscope at the time of removing the hairs.

(12) Mrs Skirving.-(the mother of Maggie S. case 8). Tinea circinata on dorsum of left wrist. No growth of the fungus, but cultures of the Staphylococcus pyogenes citreus and the Staphylococcus pyogenes albus, were obtained.

(13) Wm. Wood aet.9.- Tinea Capitis. Duration --three months. The microscope and culture gave the microsporon audouini.

(14) Mary Croll.- Ward 38. (already referred to) Tinea Capitis. Extensive disease over the vertex. Duration--eight months. The microscope shewed typical small spored fungus, the meshwork of spores closely investing the hair. Culture gave the Micro -sporon audouini.

(15) Hugh Mc Kay aet.12.- Tinea Capitis. Several patches, some pretty bald. Some hairs came out entire, but most broke. All grew the Micro-sporon audouini.

audouini.

(16) Wm. Forbes aet.8.- Patch ringworm on Right temporal region. Hairs moderately long and very fragile. Hairs were treated with alcohol. Six were inoculated but none grew the fungus. All grew the Staphylococcus epidermidis albus.

(17) Agnes Potter aet. 7.- Very extensive ringworm of the scalp of over a year's duration. Microscopically--a fine specimen of the Microsporon audouini, the sheath of small spores closely investing the hair. Typical small spored growth on agar.

(18) J. Nimmo aet.8.- Ringworm of scalp, appear -ing almost well. Three tubes inoculated, two of which grew impurities, while the third gave growths of the Microsporon audouini.

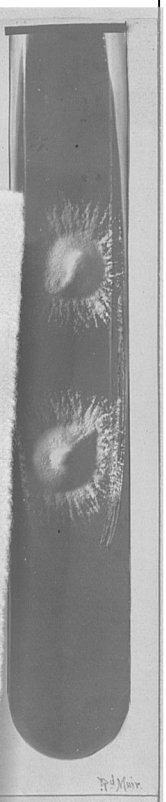
(19) Jessie Morgan aet.4.- Showing a round patch of ringworm on the scalp, with pustules and broken hairs. The patch was disinfected and pus from a freshly opened follicle was inoculated. The fungus showed signs of growth in forty-eight hours and grew rapidly with a luxuriant mycelial fringe, all along the streak. Growth proceeded very quickly, the submerged fungus taking on a brownish yellow tinge, and the surface being covered with a snow-white

white powdery growth. Subcultures were made on agar, potato, and gelatine. On the agar and potato an active powdery white growth occurred while on the gelatine, growth occurred with active liquefaction. Microscopically--long branching filaments were seen, but no spores were observed along the filaments. This was the most active growth got in any of the ringworm cases, and was unlike that obtained in any othercase.

The media used for these fungi have been glucose-agar, and glycerine-agar. There can be no doubt of the importance of using media, identical in composition and reaction for a fair comparison of results. The slightest difference,for example in the percentage of sugar present in glucose-agar, having a marked effect on the growth of the fungus.

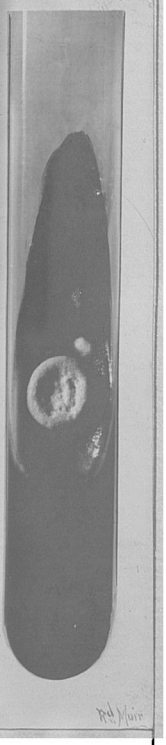
In the differentiation of ringworm fungi by culture, Fox and Blaxall maintain that "a fungus which commences so early as the third or fourth day, is almost invariably of animal origin, and nearly always an ectothrix. Next to them in rapidity come the endothrixes, and last of all, sometimes shewing no signs of starting till the tenth day, the Microsporon."

In one or two of the cases quoted, I could see no



sign of growth until at least a fortnight had passed. Even at an early stage the stellate ecto- and endothrix colonies are in marked contrast to the more circular and compact growth of the microsporon. For a detailed description of the various types of growth in the culture of Microsporon and the Tricophyta, Fox and Blaxall's papers, have been consulted.

The characters of the Tricophyta cultures as a whole have been summed up, as forming submerged sun-shaped discs, with feathery rayed margins, and yellow or white powdery surfaces, as distinguished from the downy appearance seen in the Microsporon.



FAVUS.-

(1) Jeannie Sewell aet.20.- Favus of scalp, a well-marked case. Hairs were taken after scrubbing the skull with absolute alcohol. Hair roots were cut off and inoculated on agar. One did not grow. Another gave a fine Favus growth.

(2) John Dunning aet. 18.- Had had favus, according to his own account, for fifteen years. Successful cultures were obtained in this case also.

In these two cases of Favus, the growth took the cup-shaped form, similar to what occurs on the diseased scalp.

From a variety of other cases, which cannot well be classified, I select the following as being of interest:-

(1) Pityriasis Versicolor.- In two cases of this disease, inoculation gave negative results. The microscope revealed the microsporon furfur.

(2) In a case of Lichen Pilaris, two horny plugs were removed and implanted on agar. The Staphylococcus epidermidis albus grew.

(3) A case of Impetiginous Eczema on first phalanx of the thumb. Duration--four weeks. This was doing well when an eruption appeared on both arms, consisting of hard shotty papules, on which clear vesicles developed. In places these ran together and the surface was covered with a layer of coagulated serum. Culture from an unopened vesicle gave only a single colony of the Staphylococcus epidermidis albus.

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